DETAILED ACTION

1. Claims 1-55 are rejected.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 May 2010 has been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-12, 15-24, 29-40 and 44-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over US PGPub 2003/0093436 to Brown et al (hereafter Brown) in view of US PGPub 2005/0044164 to O'Farrell et al (hereafter O'Farrell).

Referring to claim 1, Brown discloses a method for performing database operations on data obtained from a web service, the method comprising:

creating at least one proxy table in a database, each proxy table mapping to a method of the web service [creating a virtual table representative of the web service] (Brown: see [0062]-[0063] and [0074]), wherein said at least one proxy table is automatically created based on a Web Services Description Language (WSDL) description of the web service (see [0116] and Fig 10);

in response to a database operation on a particular proxy table, converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping (Brown: see [0049]);

invoking the particular method of the web service (Brown: see [0057]-[0059]);

converting results obtained from invoking the particular method into data for use at the database based upon the corresponding mapping (Brown: see [0074]); and

performing the database operation on the data at the database to generate a result set (Brown: see [0075]-[0077], lines 1-2); and

returning the result set in response to the database operation (Brown: see [0075]-[0077], lines 1-2).

However, Brown fails to explicitly disclose the further limitations of generating meta data about the mapping and storing the meta data in a database table of the database and using the meta data for converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping. O'Farrell discloses using web services to retrieve data from multiple enterprise data stores (see [0012]), including the further limitations of generating meta data [metadata 312] about the mapping and storing the meta data in a database table of the database (see [0074], lines 8-12 and Fig 3) and using the meta data for converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping (see [0076]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the mapping structure of O'Farrell with the method of Brown by replacing the DADX files with the mapping structure. One would have been motivated to do so in order to provide a form of automation, which yields significant savings and efficiencies (O'Farrell: see [0005]).

The combination of Brown and O'Farrell (hereafter Brown/Farrell) fails to explicitly disclose the limitation of automatically generating metadata. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the process of generating metadata automatic since providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to distinguish over the prior art (See *In re* Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958)).

Referring to claim 2, Brown/Farrell discloses the method of claim 1, wherein the web service comprises a service remotely available via a network [Internet] (see [0011], lines 5-6).

Referring to claim 3, Brown/Farrell discloses the method of claim 1, wherein the web service has a Web Services Description Language (WSDL) interface (Brown: see [0032], lines 1-7).

Referring to claim 4, Brown/Farrell discloses the method of claim 1, wherein said creating step includes automatically creating said at least one proxy table in response to a user input of a WSDL file name of the web service [retrieve descriptions of web services using UDDI] (Brown: see [0062]-[0063]; [0074] and [0094]).

Referring to claim 5, Brown/Farrell discloses the method of claim 4, wherein said step of automatically creating said at least one proxy table includes substeps of:

obtaining the WSDL file the web service (Brown: see [0032], lines 1-7); and

automatically creating said at least one proxy table based upon the WSDL file obtained from the web service (see [0062]-[0063]; [0074]; and [0116]).

Referring to claim 6, Brown/Farrell discloses the method of claim 1, wherein said automatically generating step includes automatically generating meta data [i.e., business name] identifying a particular method of the web service to be invoked when a database operation is received on a particular proxy table (Brown: see [0033], lines 9-12).

Referring to claim 7, Brown/Farrell discloses the method of claim 1, wherein said creating step includes mapping arguments of the method [XML elements and attributes] to fields of the proxy table [column names] (Brown: see [0047]).

Referring to claim 8, Brown/Farrell discloses the method of claim 1, wherein said creating step includes mapping arguments of the method [XML elements and attributes] to equivalent database data types [SQL data types] (Brown: see [0047]).

Referring to claim 9, Brown/Farrell discloses the method of claim 1, wherein said creating step includes creating an object encapsulating the mapping of a web method to the database [mapping file 37] (Brown: see [0045]).

Referring to claim 10, Brown/Farrell discloses the method of claim 1, wherein said automatically generating step includes storing the mapping between said at least one proxy table and methods of the web service [mapping file 37] (Brown: see [0045]).

Referring to claim 11, Brown/Farrell discloses the method of claim 10, wherein said step of converting results includes consulting the mapping for converting the results into data for application at the database [mapping file 37] (Brown: see [0045]).

Referring to claim 12, Brown/Farrell discloses the method of claim 1, wherein the database operation includes a JOIN operation and said step of performing the database operation includes joining data obtained from invoking the particular method of the web service with data stored in the database in generating the result set (Brown: see [0105]).

Referring to claim 15, Brown/Farrell discloses the method of claim 1, wherein said step of converting the database operation includes creating a Simple Object Access Protocol (SOAP) request for invoking the particular method of the web service (Brown: see [0030], lines 1-4).

Referring to claim 16, Brown/Farrell discloses the method of claim 15, wherein said step of invoking the particular method includes transmitting the SOAP request to a remote web service [service external to the database] (Brown: see [0011], lines 1-4 and [0030], lines 1-4).

Referring to claim 17, Brown/Farrell discloses the method of claim 1, wherein said step of invoking the particular method includes receiving results from the web service (Brown: see [0075]-[0077]).

Referring to claim 18, Brown/Farrell discloses the method of claim 1, wherein said step of converting results includes converting results received in Simple Object Access Protocol (SOAP) format (Brown: see [0030], lines 1-4).

Referring to claim 19, Brown/Farrell discloses the method of claim 1, wherein said step of converting results includes converting results received in Extensible Markup Language (XML) format (Brown: see [0014]; [0026]; and Fig 2).

Referring to claim 20, Brown/Farrell discloses a computer-readable medium having processor-executable instructions for performing the method of claim 1 (Brown: see [0023], lines 6-8 and [0024]).

Referring to claim 21, Brown/Farrell discloses a downloadable set of processor-executable instructions for performing the method of claim 1 stored on a web server (Brown: see [0023], lines 6-8; [0024] and [0025], lines 3-4).

Referring to claim 22, Brown discloses in a computer connected to a network and having access to a remote service, a system for performing operations at a database on data obtained from the remote service, the system comprising:

a mapping module for creating database tables representing at least some methods of a remote service accessed through a defined interface [creating a virtual table representative of the web service] (Brown: see [0062]-[0063] and [0074]), wherein said database tables and said mapping data are automatically created based on a Web Services Description Language (WSDL) interface of the remote service (see [0116] and Fig 10);

an invocation module for converting a database operation on a database table representing a method of the remote service into a call for invoking the method (Brown: see [0049] and [0057]-[0059]);

a communication module for transmitting the call for invoking the method to the remote service, and returning result values from invoking the method to the database (Brown: see [0011], lines 1-4; [0030], lines 1-4 and [0075]-[0077], lines 1-2); and

a conversion module for converting result values received from the method into database format (Brown: see [0074]).

However, Brown fails to explicitly disclose the further limitations of storing mapping data regarding methods of the remote service in a database system table and using the mapping data. O'Farrell discloses using web services to retrieve data from multiple enterprise data stores (see [0012]), including the further limitations of storing mapping data regarding methods of the remote service in a database system table (see [0074], lines 8-12 and Fig 3) and using the mapping data (see [0076]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the mapping structure of O'Farrell with the system of Brown by replacing the DADX files with the mapping structure. One would have been motivated to do so in order to provide a form of automation, which yields significant savings and efficiencies (O'Farrell: see [0005]).

Referring to claim 23, Brown/Farrell discloses the system of claim 22, wherein the remote service comprises an application available via a network [Internet] (Brown: see [0011], lines 5-6).

Referring to claim 24, Brown/Farrell discloses the system of claim 22, wherein said database tables are automatically created in response to user input of a file name of the Web Services Description Language (WSDL) interface [retrieve descriptions of web services using UDDI] (Brown: see [0062]-[0063]; [0074] and [0094]).

Referring to claim 29, Brown/Farrell discloses the system of claim 22, wherein said mapping module creates an object [mapping file 37] encapsulating the mapping of a method of the remote service to a database table (Brown: see [0045]).

Referring to claim 30, Brown/Farrell discloses the system of claim 22, further comprising: a mapping repository [database 29] for storing mappings between database tables and methods of the remote service (Brown: see Fig 3).

Referring to claim 31, Brown/Farrell discloses the system of claim 30, wherein the conversion module consults the mapping repository for converting result values into database format (Brown: see [0075]-[0077], line 2).

Referring to claim 32, Brown/Farrell discloses the system of claim 22, wherein the operation received on the database table comprises a JOIN operation and said conversion module joins result values obtained from invoking the method with data stored in the database (Brown: see [0105]).

Referring to claim 33, Brown/Farrell discloses the system of claim 22, wherein said invocation module binds the data from the operation to a Simple Object Access Protocol (SOAP) call for invoking the method of the remote service (Brown: see [0029] and [0039])

Referring to claim 34, Brown/Farrell discloses the system of claim 22, wherein said invocation module converts data from the database operation into Extensible Markup Language (XML) format (Brown: see [0014]; [0026]; and Fig 2).

Referring to claim 35, Brown/Farrell discloses the system of claim 22, wherein said invocation module creates a Simple Object Access Protocol (SOAP) request for invoking the method of the remote service (Brown: see [0030], lines 1-4).

Referring to claim 36, Brown discloses the system of claim 35, wherein said communication module sends the SOAP request to the remote service [service external to the database] (Brown: see [0011], lines 1-4 and [0030], lines 1-4).

Referring to claim 37, Brown/Farrell discloses the system of claim 22, wherein said conversion module converts result values received in Simple Object Access Protocol (SOAP) format into database data types [mapping XML elements and attributes into SQL data types] (Brown: see [0047]).

Referring to claim 38, Brown/Farrell discloses the system of claim 22, wherein said conversion module converts result values received in Extensible Markup Language (XML) format into database data types [mapping XML elements and attributes into SQL data types] (Brown: see [0047]).

Referring to claim 39, Brown/Farrell discloses the system of claim 22, wherein said conversion module provides converted result values in response to the operation on the database table (Brown: see [0075]-[0077], line 2).

Referring to claim 40, Brown discloses in a database system, a method for performing database queries on data available from an application, the method comprising:

establishing communication between a database and an application having an interface (Brown: see [0026], lines 1-7 and [0032], lines 1-3);

creating database tables to represent at least some functions of the application based on the interface, each database table corresponding to a function of the application [creating a virtual table representative if the web service] (Brown: see [0062]-[0063] and [0074]), wherein said database tables are automatically created based on a Web Services Description Language (WSDL) interface of the application (see [0116] and Fig 10);

in response to a database query received on a database table corresponding to a function of the application, generating input arguments [input parameters] expected by the function based on the database query (Brown: see [0049]);

invoking the function with the input arguments and receiving results from invoking the function (Brown: see [0057]-[0059]);

converting the results into a database result set (Brown: see [0074]); and

returning the database result set in response to the database query [the statement returns a table containing the response from the supplier] (Brown: see [0075]-[0077], lines 1-2).

However, Brown fails to explicitly disclose the further limitations of generating meta data about the mapping and storing the meta data in a database table of the database and using the meta data for converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping. O'Farrell discloses using web services to retrieve data from multiple enterprise data stores (see [0012]), including the further limitations of generating meta data [metadata 312] about the mapping and storing the meta data in a database table of the database (see [0074], lines 8-12 and Fig 3) and using the meta data for converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping (see [0076]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the mapping structure of O'Farrell with the method of Brown by replacing the DADX files with the mapping structure. One would have been motivated to do so in order to provide a form of automation, which yields significant savings and efficiencies (O'Farrell: see [0005]).

The combination of Brown and O'Farrell (hereafter Brown/Farrell) fails to explicitly disclose the limitation of automatically generating metadata. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the process of generating metadata automatic since providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to distinguish over the prior art (See *In re* Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958)).

Referring to claim 44, Brown/Farrell discloses the method of claim 40, wherein said automatically generating step includes automatically generating meta data [i.e., business name] identifying a particular function to be invoked when an operation is received on a given database table (Brown: see [0033], lines 9-12).

The combination of Brown and O'Farrell (hereafter Brown/Farrell) fails to explicitly disclose the limitation of automatically generating metadata. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the process of generating metadata automatic since providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to distinguish over the prior art (See *In re* Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958)).

Referring to claim 45, Brown/Farrell discloses the method of claim 40, wherein said step of creating database tables includes mapping arguments of a given function [mapping arguments of the method which include XML elements and attributes] to columns [column names] of the corresponding database table (Brown: see [0047]).

Referring to claim 46, Brown/Farrell discloses the method of claim 40, wherein said step of invoking the function includes binding data from the database query to a Simple Object Access Protocol (SOAP) call (Brown: see [0029] and [0039]).

Referring to claim 47, Brown/Farrell discloses the method of claim 40, wherein said step of invoking the function includes converting data from the database query into Extensible Markup Language (XML) format [XML document] (Brown: see [0088], lines 12-15).

Referring to claim 48, Brown/Farrell discloses the method of claim 40, wherein said step of invoking the function includes creating a Simple Object Access Protocol (SOAP) request for invoking the function (Brown: see [0030], lines 1-4).

Referring to claim 49, Brown/Farrell discloses the method of claim 48, wherein said step of invoking the function includes transmitting the SOAP request to a remote server [service external to the database] (Brown: see [0011], lines 1-4 and [0030], lines 1-4).

Referring to claim 50, Brown/Farrell discloses the method of claim 40, wherein said step of invoking the function includes receiving results in Extensible Markup Language (XML) format (Brown: see [0014]; [0026]; and Fig 2).

Referring to claim 51, Brown/Farrell discloses the method of claim 40, wherein said step of invoking the function includes receiving results in Simple Object Access Protocol (SOAP) format (Brown: see [0030], lines 1-4).

Referring to claim 52, Brown/Farrell discloses the method of claim 40, wherein said step of converting the results includes converting results received in Simple Object Access Protocol (SOAP) format (Brown: see [0030], lines 1-4).

Referring to claim 53, Brown/Farrell discloses the method of claim 40, wherein said step of converting the results includes converting results received in Extensible Markup Language (XML) format (Brown: see [0014]; [0026]; and Fig 2).

Referring to claim 54, Brown/Farrell discloses a computer-readable medium having processor-executable instructions for performing the method of claim 40 (Brown: see [0023], lines 6-8 and [0024]).

Referring to claim 55, Brown/Farrell discloses a downloadable set of processor-executable instructions for performing the method of claim 40 (Brown: see [0023], lines 6-8; [0024]; and [0025], lines 3-4).

5. Claims 13, 14, 25-28 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over US PGPub 2003/0093436 to Brown et al in view of US PGPub 2005/0044164 to O'Farrell et al as applied to claim 1, 22 and 40 above, and further in view of US Patent No 7,133,907 to Carlson et al (hereafter Carlson).

Referring to claim 13, Brown/O'Farrell fails to explicitly disclose the further limitation of wherein the database operation includes an insert operation on a given proxy table representing a particular method of the web service and said step of performing the database operation includes inserting a row into a shadow table of the database associated with the web service. Carlson discloses wherein the database operation includes an insert operation on a given proxy table representing a particular method of the web service and said step of performing the database operation includes inserting a row into a shadow table of the database associated with the web service (see column 1, lines 41-col 2, line 4).

It would have been obvious to one of ordinary skill in the art to update a copy as disclosed by Carlson to perform the update of Brown/O'Farrell. One would have been motivated to do so in order to maintain a back up copy in case of a collision.

Referring to claim 13, Brown/O'Farrell/Carlson discloses the method of claim 13claim 1, wherein said step of performing the database operation includes invoking the particular method of the web service associated with the given proxy table when a column that is an output parameter of the particular method is requested (Carlson: see column 1, lines 41-col 2, line 4).

Claims 25-28 and 41-43 are maintained for the reasons stated in regards to claims 13 and 14.

Response to Arguments

6. Applicant's arguments filed in regards to independent claims 1, 22 and 40 and dependent claim 4 have been fully considered but they are not persuasive.

Referring to Applicant's arguments on pages 11-12 of the Remarks, the Applicant argues that Brown fails to teach the concept of automatically generating the proxy table from a WSDL file. The examiner respectfully disagrees. As pointed out above in the rejection, Brown is considered to teach the concept of automatically generating the table since the cited paragraphs and paragraph [0110] teach the concept of a user defining the file to be utilized which is then parsed to generate the mappings.

7. Applicant's arguments on page 14 of the Remarks in regards to the shadow table have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY LOVEL whose telephone number is (571)272-2750. The examiner can normally be reached on 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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